STATE COUNCIL OF HIGHER EDUCATION

Higher Education Facilities Condition Reporting Guidelines

Instructions for Reporting Infrastructure Data

July 9, 2001

Higher Education Facilities Condition Reporting Guidelines For Infrastructure Assets

Background

In July 2000, the State Council of Higher Education for Virginia (SCHEV) and the Department of General Services (DGS) hired a consultant to evaluate the uniformity of facility condition assessment procedures used to determine the maintenance reserve needs of the Commonwealth's agencies and institutions of higher education.

The consultant's final report was released in November 2000. Among its findings, the consultant reported that institutions used various methodologies to estimate building values and to determine estimated costs of repairing building deficiencies. The consultant also found that most institutions did not fully consider the value of infrastructure assets or the cost of deficiencies of infrastructure assets when reporting the condition of their facilities. The infrastructure of an institution includes those items, which are required but are not related directly to a building, such as utilities connecting buildings to the power plant, sidewalks, and roads.

SCHEV staff, with the help of its consultant, a workgroup of institutional representatives, and DGS, has developed a list of infrastructure assets (see Appendix A) and the following guidelines for valuing those assets and reporting their deficiencies.

Instructions for Reporting Infrastructure Assets in the Facilities Condition Report

These instructions have been established to clarify what institutions should report as infrastructure in the Facilities Condition Report (FCR). Institutions should use the Infrastructure Value Worksheet to report asset specific information. The institution's total infrastructure will be summarized as one line in the FCR. A sample of the infrastructure value worksheet is included in Appendix C. It is also provided as a Microsoft EXCEL file on the SCHEV website under Policies and Guidelines / Finance and Facilities Policies. Institutions are asked to download the EXCEL file, replace the sample data with institutional data, and return the completed worksheet to SCHEV via diskette or e-mail. SCHEV staff will incorporate your infrastructure data into the FCR that has already been submitted for building values and deficiency costs.

These guidelines aim at estimating only the deferred maintenance needs of E&G infrastructure. Although not required for the 2000 FCR, SCHEV staff will continue working with institutions to determine the feasibility and desirability of collecting non-E&G data prior to the 2004-06 biennium.

A. Infrastructure Value Worksheet (Appendix C): Institutions are asked to complete the worksheet to estimate the current value of each type of infrastructure asset the institution maintains. The amount reported should include the total funds required to replace the asset at the same level of functionality based upon accurate local labor and material costs. Soft costs, such as A&E fees, project management costs, and construction contingencies should

not be included. Site preparation costs, which were initially incurred, also should not be included in the construction cost of your infrastructure asset.

In addition, it is important to note that while an institution's maintenance program may include life-cycle projections or planned component renewals, the FCR should reflect an asset's condition at a point in time.[1] As such, the cost of projected maintenance and repair, and component renewals should not be included in the infrastructure deficiencies reported to SCHEV.

With these provisions, the infrastructure value worksheet contains each of the elements described below. A detailed description of the required reporting for each element is also required below:

1. **Infrastructure asset.** Institutions should report all of the major infrastructure assets that they maintain. Appendix A includes the major types of infrastructure assets that should be reported by each institution, if applicable.

2. **Unit Measure.** The quantity of each infrastructure should be reported using a standard single unit of measure, such as linear or square feet. The worksheet identifies standard unit measures for each infrastructure type.

3. **Total Units.** Institutions should report the total units of the asset for which it is responsible.

4. **Cost Per Unit.** As a base value, SCHEV recommends that institutions value all infrastructure of a specific type at the same cost per unit. The standard unit costs provided in Appendix A are based on a compilation of actual cost data provided by several institutions, and national data sources such as RSMeans®, and Marshall & Swift® provided by the consultant and DGS. An inflationary factor has been applied to these figures to adjust them to current (January 1, 2001) dollars.

In addition, Appendix B contains specific schedules in cases where institutions may find enough variability in an asset type that it is difficult to determine one standard unit cost. These figures were derived in conjunction with DGS and the consultant and are based on national data sources such as R. S. Means® and Marshall & Swift.® An inflationary factor has been applied to all figures to adjust them to current (January 1, 2001) dollars. As indicated in the Infrastructure Unit Cost table located in Appendix A, institutions should refer to the appropriate schedule in Appendix B to estimate the base cost per unit of these asset types.

5. **Estimated Cost Value.** This calculated figure represents the base cost for the asset. The number of units that the institution owns of the infrastructure asset multiplied by the cost per unit will yield the base cost of the infrastructure asset. Institutions are required to use the unit costs per Appendix A to estimate the base replacement costs of the asset.

6. **Institution-Specific Adjustments.** It is anticipated that institutions may need to make adjustments to the estimated base cost of some infrastructure assets due to institution-specific conditions that may increase or decrease the replacement cost for each asset. For those infrastructure assets where an adjustment is made, please indicate the additional cost (or reduction in cost) and briefly explain why the adjustment is necessary.

[1] For purposes of the 2000 FCR, institutions should value their assets as of January 1, 2001.

7. **E&G Share**. The reported number or units of the infrastructure asset should be the institution's total units. The E&G share should be the percentage of the units that belong to the educational and general program.

8. **E&G Infrastructure Value.** This calculated figure is the E&G share of the infrastructure assets cost value. It is the sum of the estimated construction cost and institution-specific adjustments multiplied by the E&G percentage share of the facility. Only the E&G share of the infrastructure assets' values and deficiency costs will be carried forward to the FCR.

9. **Deficiency costs:** The cost of deficiencies reported in the FCR is the cost of existing maintenance and repair deficiencies. The identified deficiencies should meet guidelines issued by the Department of Planning and Budget (DPB). Soft costs, such as A&E fees, project management costs, and construction contingencies should not be included in deficiency costs.

A deficiency project that meets one or more of the following criteria may be included in the FCR:

- Repair or replacement of functionally obsolete, damaged, or inoperable built-in equipment such as elevators, furnaces, plumbing fixtures, air conditioning, and ventilation;
- Repair or replacement of components of plant such as exterior wood, masonry, ceilings, floors, floor coverings, doors, windows, roofs, sidewalks, parking lots, fencing, and exterior lighting;
- Repair or replacement of existing utility systems, such as steam lines, natural gas, air, electrical, water, and sewer; and
- Correction of problems resulting from erosion and drainage.

The cost of deficiencies included in one or more of the following criteria should **not** be included in the FCR:

- Maintenance contracts to clean, maintain, repair, or protect existing plant, property, or equipment;
- Routine periodic maintenance such as servicing, adjusting, minor repairs, painting, scraping, cleaning, and spraying of plant or property;
- Repair or replacement of office, motorized, medical, laboratory, electronic, photographic, educational, cultural, computerized, and other specific-use, moveable equipment that is not permanently installed as a part of the plant or property; and
- Leak testing and monitoring of underground storage tanks and the removal of underground storage tanks not associated with tank replacement.

In addition, it is important to note that while an institution's maintenance program may include life-cycle projections or planned renewal of components, the Facilities Condition Report should reflect a facility's condition at a point in time. As such, the cost of projected maintenance and repair, and component renewals should not be included in the infrastructure deficiencies reported to SCHEV. And, as with building values, the value of deficiencies reported in the FCR should not include soft costs.

B. <u>Facilities Condition Report:</u> The E&G total infrastructure value calculated on the Infrastructure Value Worksheet should be carried forward to the Facilities Condition Report. In addition, the cost of deferred maintenance of infrastructure assets should be reported.

Due to the fact that institutions have already submitted building data for the 2000 FCR, SCHEV staff will add the infrastructure data to the FCR for the 2000 reporting cycle. Therefore, institutions need to only submit the Infrastructure Value Worksheet at this time.

C. Record Keeping: Institutions are not required to submit detailed deficiency data to SCHEV. However, SCHEV staff shall, as needed, request this information on an institution's buildings or infrastructure.

D. Web Access: These instructions can be accessed on the SCHEV website under Policies and Guidelines / Finance and Facilities. The sample worksheet and report can also be downloaded from the website.

Appendix A
Infrastructure Unit Cost

Infrastructure Asset Description			Unit of Measure	Valuation Cost Per Unit
Campus Drives & Streets:				
	a.	concrete pavement	Sq. Yd.	29.00
	b.	asphalt pavement	Sq. Yd.	14.00
	c.	parking area - paved	Sq. Yd.	24.00
	d.	parking area - unpaved	Sq. Yd.	10.00
	e.	pedestrian bridge	Sq. Ft.	107.00
Sidewalks:				
	a.	concrete	Sq. Yd.	43.00
	b.	asphalt pavement	Sq. Yd.	16.00
	c.	brick or flagstone	Sq. Yd.	93.00
	d.	gravel	Sq. Yd.	10.00
	e.	exterior stairs	Lin Ft.	20.00
Automatic Irrigation			Lin. Ft.	3.00
Exterior lighting			Pole	2,313.00
Signage			Ea.	63.00
Electrical:			Lin. Ft.	19.00
	a.	electric Lines	Lin. Ft.	19.00
	b.	electric transformers		See Schedule
	c.	electric substations		See Schedule
Communication Cable			Lin. Ft.	6.15
Gas Mains			Lin Ft.	33.00
Direct-Bury Steam and Chilled Water Lines			Lin. Ft.	100.00
Steam and Chilled Water in Tunnels:				
	a.	up to 3-1/2"	Lin. Ft.	42.00
	d.	4" to 8"	Lin. Ft.	159.00
	e.	10" and larger	Lin. Ft.	205.00
Water Mains:				
	a.	up to 4"	Lin. Ft.	24.00
	b.	4-1/2" to 8"	Lin. Ft.	38.00
	c.	9" and larger	Lin. Ft.	53.00
Utility Tunnels				See Schedule
Storm Sewer:				
	a.	up to 12"	Lin. Ft.	33.00
	b.	13" to 26"	Lin. Ft.	62.00
	c.	27" to 41"	Lin. Ft.	88.00
	d.	42" to 59"	Lin. Ft.	130.00
	e.	60" and greater	Lin. Ft.	175.00
	f.	4' x 6' box culvert	Lin. Ft.	270.00
Sanitary Sewer:				
	a.	up to 2"	Lin. Ft.	36.00
	b.	3" to 7"	Lin. Ft.	54.00
	c.	8" to 12"	Lin. Ft.	98.00
	d.	13" to 15"	Lin. Ft.	108.00
	e.	16" to 24"	Lin. Ft.	160.00
	f.	greater than 24"	Lin. Ft.	203.00

INFRASTRUCTURE UNIT COST

Infrastructure Asset Description			Unit of Measure	Valuation Cost Per Unit
Septic Tanks/Fields Basic System:				
	a.	basic system plus pump	Each	5,800.00
	b.	basic system plus pump and pre-treatment	Each	17,800.00
Sewage Pump Stations:				
	a.	small station - less than 5,000 gallons/day	Each	23,700.00
	b.	medium station - 5,000 to 15,000 gallons/day	Each	105,750.00
	c.	large station - greater than 15,000 gallons/day	Each	227,850.00
Tanks:				
	a.	water tanks		See Schedule
	b.	above ground fuel storage		See Schedule
	c.	underground fuel storage		See Schedule
Fire Plugs			Each	2,242.00
Bulkheads			Sq. Ft.	556.00
Piers			Sq. Ft.	40.00
Retaining Walls			Lin. Ft.	See Schedule
Fencing - chain link			Lin. Ft.	22.00
Phy.Ed./Recreation Areas:				
	a.	playing fields	Sq. Ft.	5.00
	b.	outdoor basketball courts	Sq. Ft.	7.75
	c.	tennis courts	Sq. Ft.	7.35
	d.	running tracks	Sq. Ft.	8.50
	e.	bleachers		See Schedule

Appendix B
COSTING SCHEDULES

Transformers				Substations	
Dry Type		**Oil Filled**			
Single-phase, 240/480-V primary, 120/240 secondary		Three phase or Y, 5-KV or 15-KV with taps, 277/480-V secondary		**KVA Rating**	**Cost/KVA**
				150	$235
Size	**Cost**	**Size**	**Cost**	500	$120
3 KVA	500	150 KVA	14,250	1000	$85
5	600	300	17,500	2000	$60
7.5	890	500	27,250		
10	1,075	750	34,250		
15	1,300	1,000	45,000		
25	1,675	1,500	49,000		
37.5	2,500	2,000	58,000		
50	2,950	2,500	60,500		
75	3,800	3,000	72,000		

Underground Fuel Storage

Costs are averages for fiberglass and steel tanks, completely installed, including fittings.

	Fiberglass		**Steel (sti-P3)**		**Fiber Coated Steel**	
Nominal Capacity (gallons)	**Single Wall Tank Cost**	**Double Wall Tank Cost**	**Single Wall Tank Cost**	**Double Wall Tank Cost**	**Single Wall Tank Cost**	**Double Wall Tank Cost**
1,000	3,150	5,775	2,520	4,305	3,045	4,550
2,000	3,990	7,210	3,290	5,165	3,850	5,600
3,000	4,515	8,068	3,675	6,020	4,375	6,937
4,000	5,093	9,398	4,288	6,720	4,935	7,350
5,000	5,810	10,150	4,900	8,365	5,583	8,925
6,000	6,720	11,830	5,810	9,503	6,475	10,115
8,000	7,490	12,513	6,510	10,675	7,245	11,410
10,000	8,960	14,525	7,928	13,055	8,680	14,000
12,000	10,325	16,485	8,925	14,210	9,975	15,960
15,000	12,600	19,950	10,920	18,970	12,250	19,425
20,000	16,450	25,025	14,175	21,875	15,925	23,660
25,000	2,030	30,450	17,675	27,195	19,600	28,700
30,000	24,325	35,525	20,825	32,725	23,275	33,600
50,000	40,250	56,000	32,900	50,925	N/A	51,625

COSTING SCHEDULES

Above Ground Fuel Storage Tanks

Costs are average for UL-listed cylindrical internal steel tanks encased inside a 6" pre-cast concrete vault, providing a 2-hour fire-wall and ballistic protection. The protective concrete outer shell is pre-cast in two sections to allow periodic internal tank inspection. Costs include fittings and installation on the buyer's foundation.

Capacity	Size	Single Compartment		Dual Compartment	
(gallons)	(feet)	Single Wall	Double Wall	Single Wall	Double Wall
1,000	5 1/2 x 12	$9,725	$12,450	$11,000	$14,000
2,000	7 x 14	14,875	19,250	16,250	2,100
4,000	9 1/2 x 13	23,250	30,250	27,000	35,000
6,000	9 1/2 x 18	30,000	39,000	33,750	44,000
8,000	9 1/2 x 23	40,000	52,000	43,500	56,750
10,000	9 1/2 x 29	43,500	56,750	47,000	61,250
12,000	9 1/2 x 34	52,500	68,750	56,500	73,500

Utility Tunnels

The following costs of tunnels carrying utilities between buildings are smoothed averages of reinforced concrete-lined tunnels **per cubic foot** of tunnel including lighting and drainage.

Wall Thickness	Light Soil	Medium Soil	Hardpan	Rock
3"-5"	$12.55	$13.75	$15.25	$16.75
5"-7"	14.70	16.50	18.00	20.15
7"-10"	17.20	19.20	21.65	24.10

Retaining Walls (concrete)

Per Lin. Ft.

Wall Height (excluding footing)	Concrete Gravity Wall	Reinforced Concrete
4'	$133	$133
6'	$204	$199
8'	$270	$245
10'	$581	$520
20'	$770	$689

COSTING SCHEDULES

Welded Steel Water Tanks

Costs are average costs of surface reservoirs including typical tank ancillaries such as roofs, ladders, painting, fittings on tank, etc.

Capacity (gallons)	Cost	Capacity (gallons)	Cost
100,000	$ 93,450	750,000	$ 289,800
125,000	$ 100,800	1,000,000	$ 334,950
150,000	$ 108,938	1,500,000	$ 467,513
200,000	$ 123,113	2,000,000	$ 569,363
250,000	$ 138,863	2,500,000	$ 665,700
300,000	$ 153,825	3,000,000	$ 761,775
400,000	$ 192,413	4,000,000	$ 929,250
500,000	$ 225,750	5,000,000	$ 1,086,488

Grandstands and Bleachers

The following are typical costs of grandstands and bleachers. Costs include stairs, ramps, handicap platforms and press boxes commensurate with type and quality, as well as designers' fees.

Type	Per Square Foot (Horizontal Projection)	Per Seat
Permanent bleachers, wood frame and benches		
up to 1,000 seats	$16.00	$53.00
1,0000 to 2,000 seats	$15.00	$50.00
over 2,000 seats	$14.00	$46.00
Grandstand bleachers, open steel frame, metal, fiberglass or wood benches, school or fairground type;		
up to 1,000 seats	$40.00	$130.00
1,000 to 5,000 seats	$38.00	$120.00
over 5,000 seats	$37.00	$110.00
add for roofed areas	$8.00	$24.00
add for press box area	$40.00	
Concrete or steel bleachers, no interior construction, stadium type, closed deck;		
under 5,000 seats	$62.00	$210.00
5,000 to 10,000 seats	$61.00	$205.00
over 10,000 seats	$60.00	$200.00
add for roofed areas	$10.00	$30.00
Concrete or steel bleachers with built-in dressing and training rooms, restrooms snack bars, press box, lighting, college or small municipal stadium type;		
under 5,000 seats	$100.00	$300.00
5,000-15,000 seats	$83.00	$260.00
over 15,000 seats	$80.00	$250.00
add for roofed areas	$10.00	$30.00

Appendix C

INFRASTRUCTURE VALUE WORKSHEET
2000 FACILITIES CONDITION REPORT

	Baseline Costs				Institution-Specific		E&G	DEFICIENCY BACKLOG	
Infrastructure Asset	Unit Measure	Quantity	Unit Cost	Estimated Value	Adjustments [1]	E&G Share	Infrastructure Value	Operating	Maintenance Reserve
Water Main up to 4"	Linear Feet	3,500	$23	**$80,500**	**$1,500**	80%	**$65,600**	**$0**	**$0**
Paved Parking Area	Square Yard	5,000	$24	**$120,000**	**$0**	10%	**$12,000**	**$0**	**$0**
Total Infrastructure				**$200,500**	**$1,500**		**$77,600**	**$0**	**$0**

[1] Please explain why the adjustment is necessary.